Drawing the krtań: Laryngeal alternations in Polish
Andrew Lamont, University of Massachusetts, Amherst

Polish exhibits the cross-linguistically common processes of final obstruent devoicing and voice assimilation (1) (Rubach 1996, Gussmann 2007, inter alia). These processes extend to clusters containing both obstruents and sonorants (2) (the data below are representative of the dialect spoken in Warsaw). This paper argues that these and other patterns in the language result from sonorants surfacing with laryngeal nodes in obstruent-sonorant (OS) clusters, making them susceptible to the same constraints responsible for the alternations in (1), which they would not otherwise have.

1. a.-xlEb-a ‘bread (gen.)’ b. xlEp ‘bread’
   c. ʒal-a ‘frog’ d. ʒap-k-a ‘frog (dim.)’
   e. prɔc-i-tɛ ‘ask’ f. prɔz-b-a ‘request (noum)’
   g. kɔfɛ ‘basket (nom. pl.)’ h. kɔg ɓoruvɛk ‘basket of berries’

2. a. mɔgw-a ‘she could’ b. mukw ‘he could’
   c. drv ‘pieces of wood’ d. krtań ‘larynx’
   e. vɔatr ʃxɔdŋi ‘easterly wind’ f. vɔadr zaxɔdŋi ‘westerly wind’
   g. ɡavr dəlɛcix ‘distant lair (gen. pl.)’ h. kʃɛf rɛdestu ‘knotgrass shrub’

Like final obstruents (1a-b), obstruent-sonorant (OS) clusters devoice word-finally (2a-b). Like obstruent clusters (1c-h), obstruent-sonorant-obstruent (OSO) clusters must agree in voice; the data in (2c-d) illustrate this with tautomorphemic clusters. This restriction results in word-final OS clusters assimilating to following obstruents, as in (2e-f). In isolation, wiatr ‘wind’ surfaces with a final voiceless OS cluster, like (2b): [vɔatr]. This surface form is also found before words with initial voiceless obstruents, as in (2e). Before words with initial voiced obstruents, however, the final cluster surfaces voiced, as in (2f), producing an OSO cluster that agrees in voice.

While the data in (2c-f) demonstrate that the same pressure on obstruent clusters to agree in voice is felt by OSO clusters, not all OSO clusters yield to it. The data in (2g-h) contain underlying /vrd/ clusters, but surface differently depending on the location of the word boundary. In (2g), the final OS clusters surfaces voiced, agreeing with the following voiced obstruent. In (2h), where the word boundary separates an obstruent from a word-initial sonorant-obstruent (SO) cluster, the final obstruent devoices, despite resulting in an OSO cluster that disagrees in voice.

This paper argues that these and other patterns in the language result from sonorants surfacing with laryngeal nodes ([lar]) in OS clusters. A binary [voice] feature is assumed to be housed on the [lar] node (Rubach 1996). Following Rice & Avery (1989) and Rice (1993), sonorants do not surface with [lar] nodes elsewhere, while obstruents surface with them by default. Agreement and final devoicing is captured through the interaction between markedness and positional faithfulness constraints (Lombardi 1999, 2001).

This analysis, which uses Harmonic Serialism (Prince & Smolensky 1993/2004, McCarthy 2000, et seq.), diverges from Lombardi’s (1999) in defining the relevant constraints over [lar] nodes, rather than over obstruents. For example, Agree(voice) is defined as in (3) below. Any segments that surface with [lar] nodes are therefore susceptible to agreement and final devoicing.

3. Agree(voice) Assign one violation mark for every pair of adjacent [lar] nodes with mismatching values for [voice].

This analysis proposes a new constraint, HaveLar, that compels segments following obstruents to surface with [lar] nodes, as defined in (4). This constraint dominates Agree(voice) and *[+voice], resulting in the desired feeding relation between [lar] node insertion and voice assimilation and final devoicing.

4. HaveLar Assign one violation mark for every segment without a [lar] node that is immediately preceded by an obstruent.
5. **Step 1: \([\text{LAR}]\) spreading**

<table>
<thead>
<tr>
<th>(v^1\text{atr} \text{za}x\text{od}p\text{i})</th>
<th>HAVE(\text{LAR})</th>
<th>DEP</th>
<th>NO(\text{LINK})((\text{LAR}))</th>
<th>AGREE</th>
<th>(<em>[+\text{VOICE}]</em>)</th>
</tr>
</thead>
</table>
| \(\begin{array}{c}
\text{L} \\
\text{L}
\end{array}\) | | | | | |
| \(\ldots\text{tr z}\ldots\) | \(\begin{array}{c}
\text{L} \\
\text{L}
\end{array}\) W1 | L | L | 1 |
| b. \(\begin{array}{c}
\text{L} \\
\text{L} \\
\text{L}
\end{array}\) | W1 | L | 1 | W2 |
| \(\rightarrow\) c. \(\begin{array}{c}
\text{L} \\
\text{L} \\
\text{L}
\end{array}\) | 1 | 1 | 1 |

**Step 2: \([\text{voice}]\) assimilation as coalescence**

<table>
<thead>
<tr>
<th>(v^1\text{atr} \text{za}x\text{od}p\text{i})</th>
<th>AGREE</th>
<th>IDENT(\text{ONS})</th>
<th>(<em>[+\text{VOICE}]</em>)</th>
<th>IDENT</th>
<th>UNIFORM</th>
</tr>
</thead>
</table>
| \(\begin{array}{c}
\text{L} \\
\text{L}
\end{array}\) | \(\begin{array}{c}
\text{L} \\
\text{L}
\end{array}\) W1 | | 1 | L | L |
| \(\ldots\text{tr z}\ldots\) | \(\begin{array}{c}
\text{L} \\
\text{L} \\
\text{L}
\end{array}\) | W1 | 1 | L | 1 |
| b. \(\begin{array}{c}
\text{L}
\end{array}\) | \(\begin{array}{c}
\text{L} \\
\text{L}
\end{array}\) W1 | L | 1 | 1 |
| \(\rightarrow\) c. \(\begin{array}{c}
\text{L}
\end{array}\) | 1 | 1 | 1 |

\(\text{HAVE\text{LAR}}\) dominates faithfulness constraints that penalize spreading \(\text{[LAR]}\) nodes onto adjacent segments, \(\text{NO\text{LINK}(LAR)}\), and inserting \(\text{[LAR]}\) nodes, \(\text{DEP(LAR)}\). The interaction of these constraints is illustrated in the tableaux in (5). For space, \(\text{[LAR]}\) nodes are represented as ‘L’ and only relevant nodes are shown. In Step 1, the \(\text{[LAR]}\) node of the /t/ in \(\text{wi}at\text{r} ‘\text{wind}’\) spreads onto the final /r/. This satisfies \(\text{HAVE\text{LAR}}\), but creates a violation of \(\text{AGREE(VOICE)}\) by bringing two \(\text{[LAR]}\) nodes with different values for \([\text{VOICE}]\) together. In Step 2, this violation is alleviated by assimilating the shared \([\text{VOICE}]\) feature of the OS cluster to that of the following obstruent. This is shown as coalescence of the two \(\text{[LAR]}\) nodes, which is independently motivated elsewhere in the analysis.

The difference between OS\#O clusters (2e-g) and O\#SO clusters (2h) is captured by positional variants of \(\text{DEP(LAR)}\) and \(\text{NO\text{LINK}(LAR)}\) tied to word-initial position (Casali 1997), which dominate \(\text{HAVE\text{LAR}}\). This ranking allows sonorants to surface without \(\text{[LAR]}\) nodes word-initially, but coerces them to surface with \(\text{[LAR]}\) nodes elsewhere. In cases like (2h), the initial /\(\text{tr}/\) of \(\text{rdestu} ‘\text{knotgrass}’\) does not surface with a \(\text{[LAR]}\) node. Without an adjacent \(\text{[LAR]}\) node to agree with, the final /\(\text{v}/\) of \(\text{krzew} ‘\text{shrub}’\) devoices.

This analysis extends to pre-sonorant voicing in prepositions. Prepositions form a single prosodic word with their complements (Rubach 1996), whose initial segments are therefore not word-initial. Sonorants in this position surface with \(\text{[LAR]}\) nodes and trigger assimilation of the preposition-final obstruent, which is parsed as a coda (Rubach 1996). This can be seen in the minimal pair \(\text{[bez} [\text{rado}^\text{ci}\text{t}\text{ci}\text{]}\_\text{ϕ} ‘\text{lilac of joy}’\) with two nouns forming two prosodic words and \(\text{[bez} \text{rado}^\text{ci}\text{t}\text{ci}\text{]}\_\text{ϕ} ‘\text{without joy}’\) with the preposition \(\text{bez} ‘\text{without}’\) forming one prosodic word with the noun \(\text{rado}^\text{ci}\text{t}\text{sci} ‘\text{lilac}’\).

Finally, this accounts for a dialectal difference between the Warsaw dialect and the Krakow dialect. In the former, word-final obstruents devoice before word-initial sonorants (2h). In the latter, word-final obstruents are voiced in this position. With these constraints, the only difference between the dialects is that in Krakow, \(\text{HAVE\text{LAR}}\) dominates \(\text{DEP(LAR)\text{INITIAL}}\), coercing word-initial sonorants to surface with \(\text{[LAR]}\) nodes, which feeds regressive assimilation at word boundaries.

Previous approaches have relied on arbitrarily determined rule orderings to capture the difference between OS\#O and O\#SO clusters (Rubach & Booij 1990, Bethin 1992, Rubach 1996). These analyses problematically predict that languages should display the opposite asymmetry, where O\#SO clusters agree in voice and OS\#O clusters are exempt. The present analysis makes a more restrictive prediction by linking the transparency of sonorants to positional faithfulness, while unifying diverse phenomena and doing so without significantly augmenting the theory.